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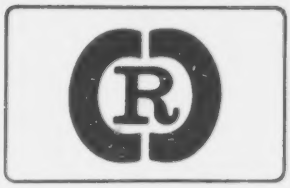

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Consumers' Choice of Consumer Loan Contract Terms

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CONSUMERS' CHOICE OF
CONSUMER LOAN CONTRACT TERMS

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Abstract

This study uses empirical data to evaluate the factors associated with consumers' choice of adjustable-rate versus fixed rate auto loans. This report provides the first empirical analysis of this consumer choice process and the results contained therein should be of interest to lenders, policymakers, marketers and consumer advocates. The consumer loans analyzed are automobile loans which represent the second largest single loan product most consumers ever use. Although adjustable-rate contracts have been available to this segment of credit customers for only a short period of time, the product was readily received by consumers in those markets where it was available. This study provides evidence of the types of consumers who gravitate to different types of loan contracts and suggests some strategies for marketing loan contract terms. The study also addresses the issues of (1) consumers' understanding of the loan contracts they choose and (2) adverse selection bias and its effect on the trade-off between interest-rate risk and credit-risk for loan portfolio managers.

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A. Charlene Sullivan

What are the factors considered by consumers as they choose between fixed- and adjustable-rate consumer loans? This study is the first empirical analysis of the factors that influence consumers' choice between fixed- and adjustable-rate and fixed- and adjustable-payment consumer instalment loans. One of our concerns when we started the study was that early adjustable-rate programs did not specify different credit standards for adjustable- and fixed-rate borrowers although one would expect that higher credit standards would be set for adjustable-rate loan customers. We investigated the presence of adverse selection bias in consumers' choice of loan contracts to address our concern about the trade-off between interest-rate risk and credit-risk as lenders substitute adjustable-rate for fixed-rate loans in their portfolio.

I. The Model

How do borrowers choose between adjustable- and fixed-rate loan contracts? Baesel and Biger [2] developed a model of borrower's choice of fixed-rate and index-linked mortgages which specified the choice as a function of the difference in quoted interest rates for the fixed-rate and index-linked mortgages, and of the covariance between the borrower's expected labor income and the expected rate of inflation. In an extension of that work, Statman [5] developed a model which specified that the

borrower's choice also depended on the relationship between expected changes in the net value of the collateral for the mortgage and the expected rate of inflation.

In an empirical analysis of borrower's choice of mortgage loan contracts, Dhillon, Shilling and Sirmans [3] found that whether households had two incomes, were co-borrowers, or married couples had a significant impact on preference for fixed-rate mortgages. Borrowers with greater wealth preferred adjustable-rate mortgages. Liquid asset balances and short-term liabilities had no significant effect on borrowers' choice of adjustable- versus fixed-rate mortgage contracts. Changes in the number of discount points paid by borrowers had the largest impact on the probability of the selection of an adjustable-rate mortgage with interest rate caps. The authors' general conclusion was that the relative costs of fixed- and adjustable-rate mortgages affect some borrowers' choices more than others.

In this study of borrowers' choice of loan contract terms, we present the first analysis of factors associated with the choice between adjustable- and fixed-rate contracts in the shorter-term segment of the household loan market. We test the following hypotheses:

Borrowers who chose adjustable-rate loans differ from borrowers who chose fixed-rate consumer loans in terms of:

H_1 = Opinions on the expected annual rate of inflation and consumer loan rate trends over the life of the loan.

H_2 = Opinions on whether their income will grow faster, at the same rate, or slower than expected inflation.

H_3 = Tolerance for financial risks.

H_4 = The relative importance of various loan contract terms.

We expected to find that consumers who chose fixed-rate contracts had based their choice on expectations of increasing inflation and interest rates for auto loans (above the level observed at the time the contracts under study were chosen). We also expected fixed-rate contract holders to have anticipated constant real income or even a decline in real income over the life of the contract. Finally, we expected fixed-rate loan customers to have a low tolerance for financial risk.

We expected adjustable-rate loan customers to have anticipated a decline in the annual rate of inflation and lower auto loan rates over the life of the loan contract. At the same time we expected them to anticipate positive growth in real income but to also have a high tolerance for financial risk.

II. The Data

A stratified sample of 851 consumers who had obtained fixed- or adjustable-rate auto loans was drawn from the customer file of a commercial bank which was one of the first banks to offer an adjustable-rate consumer loan product.[1] The sample contained 225 borrowers (26.4 percent) with fixed-rate loans and 626 borrowers (73.6 percent) with adjustable-rate loans. Forty-five percent of the sample had indirect loans while the balance had obtained their loans directly from the bank.[2] The bank's total consumer loan portfolio contained 66 percent adjustable-rate, and 34 percent fixed-rate loans. At the time the sample frame was drawn, 81 percent of direct auto loans and 87 percent of indirect auto loans were adjustable-rate contracts.

The adjustable-rate loan index for this particular program was based on a four-week average of the six-month money market certificate rate plus 300 basis points (called the Consumer Index). For the sample of contracts analyzed in this study, the average annual percentage rate (APR) for the fixed-rate loans was 100 basis points higher than the average for adjustable-rate loans. Further, the adjustable-rate loan customer had a choice between a contract with a constant monthly loan payment with an extendable term or a contract with a constant term and a variable monthly payment.

The adjustable-rate loan program was designed such that the interest rate on the loan could be changed monthly for an unlimited number of times during the life of the loan, according to the amount of the increase or decrease in the Consumer Index rate. However, the annual percentage rate could not increase over the rate permitted by Indiana or Federal law in effect at the time of any adjustment. (Indiana adopted the Uniform Consumer Credit Code in 1971.)

The interest rate for all fixed- and adjustable-rate contracts was specified as simple interest on the unpaid balance. There was no prepayment penalty for either type of contract.

A six-page mail questionnaire was sent to each customer in the sample frame in early July 1984 (see Appendix A).[3] A total of 247 usable questionnaires were returned for a response rate of 29 percent.[4]

A. Nonresponse Bias

We used the following data to test the dimensions along which respondents to the questionnaire differed from nonrespondents and thus may have introduced bias into the results of the analyses.

1. Whether the loan had a fixed- or adjustable-rate.
2. Whether the loan was direct or indirect.
3. Borrower's credit score.

Loan Type. There was not a statistically significant difference in the distribution of fixed- and adjustable-rate loans for the respondent and nonrespondent groups. The respondent group included 28 percent fixed-rate and 72 percent adjustable-rate loan customers. Nonrespondents included 26 percent fixed-rate and 74 percent adjustable-rate loan customers.

Direct versus Indirect Sale. Consumers who had obtained their loans directly from the bank were more likely to respond to the survey than indirect loan customers. Sixty-three percent of respondents had direct loans while only 52 percent of nonrespondents had direct loans. This difference could affect the results of the analysis in several ways. The first is that, on average, direct loan customers tend to be of better credit quality than indirect loan customers. Second, the direct loan customer may receive more information about his or her loan at the point of sale than the indirect loan customer. Consequently, the results of our analysis of factors affecting customer choice of loan contract terms may not be representative of the population of borrowers with adjustable-rate loans but may be representative only of the population of borrowers who get their loans directly from financial institutions.

Credit Score. The respondents were significantly more likely to have higher credit scores (lower risk) than nonrespondents, a finding that is consistent with their being more likely to have a direct loan than nonrespondents (Exhibit 1). To correct for the effect of nonresponse bias on our treatment of the issue of adverse selection bias we use the entire sample rather than only the respondent sample in that section of the analysis.

B. Other Sample Problems

The process by which consumers make choices of loan contract terms is subject to a great many influences that we may not have included in our questionnaire. Specifically, lenders have a great deal of influence over the incentives of auto dealers to sell a particular type of loan contract. In the case of the bank which cooperated in this study, there were no incentives used to get dealers or loan officers to promote one loan product over another. In addition, the bank did not use different credit standards for adjustable- versus fixed-rate loan customers. Therefore, to the best of our ability we were holding constant institutional factors influencing consumers' choice.

Additional concerns may be the rather small sample size, especially the fixed-rate loan group, and the fact that the data were collected in only one city using the loan customers of only one bank. Although we are confident that possible biases in the data have been identified, until broader studies can be made, caution should be used in generalizing the results of this study to the broad population of auto loan customers.

EXHIBIT 1

CREDIT SCORE DISTRIBUTION BY

RESPONDENTS VS. NONRESPONDENTS

Score	Nonrespondents	Respondents
186-222	30%	24%
223-258	38	37
259-294	26	34
295-331	6	5
	100%	100%

$X^2 = 6.10$ Groups significantly different at 10 percent level of confidence.

NOTE: Credit score was calculated by the bank. Neither the variables used in the calculation nor the variable weightings were requested for our analysis. The bank did not specify a different minimum acceptable credit score for adjustable- and fixed-rate loan customers.

SOURCE: CRC Adjustable-rate Study, 1984.

III. The Univariate Analysis: The Choice Process

To measure the factors which influence consumer choice of loan contract terms, we analyzed three groups of consumers. Group I included borrowers with fixed-rate loans and made up almost 28 percent of the total sample. Group II included borrowers with adjustable-rate contracts but with fixed monthly payments. This group represented almost 46 percent of the total sample and 63 percent of those with adjustable-rate loans. Group III included borrowers with adjustable-rate contracts with adjustable monthly payments. This last group included 26 percent of the total sample and 37 percent of borrowers with adjustable-rate loans.

A. Economic Expectations

We hypothesized that holding other things constant, consumers chose loan contract terms such that their expected cost of borrowing would be minimized, given their economic expectations and risk preferences. The economic expectations analyzed were the respondents' estimates for the next three to four years (roughly, the maturity of the contracts being studied) of the average expected annual rate of inflation, the expected level of future interest rates for auto loans and expected growth of total family real income.

1. Inflation Expectations. The inflation expectations of consumers choosing fixed-rate contracts differed from those of consumers choosing adjustable-rate, adjustable-payment contracts (Exhibit 2). The fixed-rate loan group (Group I) was considerably more likely to expect an annual inflation rate of ten percent or more and less likely to anticipate a low rate of inflation over the life of their loan than the other two groups.

EXHIBIT 2

EXPECTED ANNUAL RATE OF INFLATION

	Group I	Group II	Group III
	Fixed-Rate	Adjustable-Rate	
Average Expected Inflation		Fixed-payment	Adjustable-payment
5% or less	15%	18%	30%
6 to 10%	60	70	60
Over 10%	10	5	2
Don't know	15	7	8
	100%	100%	100%

X^2 = 12.93 Groups significantly different at ten percent level of confidence.

Response to: The annual rate of inflation CURRENTLY is about five percent. Over the next 3 to 4 years, do you think the AVERAGE ANNUAL RATE OF INFLATION will be: 5% or less; 6-10%; Over 10%; Don't know.

SOURCE: CRC Adjustable-rate Study, 1984.

The adjustable-rate, adjustable-payment loan group (Group III) was more likely than the other two groups to expect annual inflation of five percent or less and less likely to expect a high rate of inflation over the life of the loan. These results suggest that consumers generally understood that the interest rate for adjustable-rate loan contracts indexed by a short-term rate moves with the inflation rate and chose contracts that would minimize their total cost of borrowing if their expectations were realized in the marketplace.

Borrowers with fixed-rate loans were perhaps less certain about the outlook for future inflation. In fact, members of Group I were twice as likely as the other groups to have no opinion about future inflation rates. The fixed-rate loan group also tended to be more backward-looking in making estimates of future inflation. In a recent study [1], consumers were found to project future inflation on the basis of past experience (be backward-looking).

2. Expected Auto Loan Rates. Consumers' expectations of the rate of inflation should be positively correlated with their expectations of future loan rates and generally this was the case across the three groups. Group I was more likely than the other two groups to expect a high rate of inflation or be uncertain about expected inflation and was also more likely than the other two groups to expect loan rates to be above the current level. These expectations apparently motivated a contract choice that would lock in today's rate (Exhibit 3). Adjustable-rate customers who chose the adjustable-payment option (Group III) were more likely to expect a low rate of inflation and declining auto loan rates during the lives of

the contracts analyzed. Through their choice of adjustable-rate, adjustable-payment loans, they were in a position to benefit in terms of both cost of credit and monthly cash flow from falling rates.

3. Income Growth Relative to Expected Inflation. The respondents were not notably optimistic or pessimistic about the expected rate of growth in their real income. About one-third of the respondents expected their income to grow faster than inflation while about one-third expected income to increase less than inflation.

The distributions of expected real growth in personal income showed that Groups I and III differed rather dramatically in that dimension (Exhibit 4) with Group I being more pessimistic and Group III being more optimistic. Both groups opting for fixed monthly payments were more pessimistic about future growth of real income than those opting for an adjustable monthly loan payment. Also, those with fixed-payment obligations were more likely to have no opinion about future real income growth than those who had adjustable-payment obligations.

These results consistently support the hypotheses that consumers' choices of loan contract terms are a function of their economic expectations of economic events that would affect their cost of credit and their ability to incur the cash flow risk associated with an adjustable-rate contract. Those with adjustable-rate, adjustable-payment loans tended to be more optimistic about economic trends in general and were more confident that their income would rise faster than inflation. Those with fixed-rate loans were less optimistic about the future or were unable to make estimates. There were only slight differences in the expectations of the two groups of borrowers who had opted for a loan with a constant

EXHIBIT 3

EXPECTED INTEREST RATES FOR AUTO LOANS

	Group I	Group II	Group III
	Fixed-Rate	Adjustable-Rate	
		Fixed-payment	Adjustable-payment
Above current level	54%	43%	41%
Same as current level	37	46	36
Below current level	4	5	19
Don't know	5	6	4
	100%	100%	100%

$\chi^2 = 13.42$ Groups significantly different at ten percent level of confidence.

Response to: On average over the next 3 or 4 YEARS, do you expect INTEREST RATES FOR AUTO LOANS to be ABOVE THE CURRENT LEVEL, ABOUT THE SAME, or BELOW THE CURRENT LEVEL?

SOURCE: CRC Adjustable-rate Study, 1984.

EXHIBIT 4

EXPECTED INCOME GROWTH VERSUS INFLATION

	Group I	Group II	Group III
	Fixed-Rate	Adjustable-Rate	
		Fixed-payment	Adjustable-payment
Income grow more than inflation	30%	35%	41%
Income grow same as inflation	24	23	38
Income grow less than inflation	40	34	21
Don't know	6	7	0
	100%	100%	100%

X^2 = 12.16 Groups significantly different at ten percent level of confidence.

Response to: Over the next 3 OR 4 YEARS do you expect YOUR (FAMILY) INCOME will go up MORE THAN INFLATION, about the SAME AS INFLATION, or LESS THAN INFLATION?

SOURCE: CRC Adjustable-rate Study, 1984.

monthly payment. Undoubtedly the two types of contracts were perceived as being different in terms of risk or uncertainty of required cash flows to retire the loans. The following analysis of risk preferences will provide some insight into the factors that influenced the choices of those two groups.

B. Risk Preferences

An individual's tolerance for risk or ability to absorb fluctuations in the size of outstanding debt obligations or the size of the monthly payment attributable to the impact of an adjustable-rate loan may play a role in the choice between a fixed- or adjustable-rate loan and a fixed- or adjustable-payment loan.

1. Attitude Toward Financial Risk. Groups I and II tended to be more risk averse while Group III included more consumers willing to take above average or substantial financial risk (Exhibit 5). However, the distributions of risk preferences were not significantly different across the three groups.

2. Variability of Income. In terms of variability of monthly income, Groups II and III were similar with both groups generally expecting more income variability than consumers who had chosen a fixed-rate, fixed-payment loan (Exhibit 6). Again, however, the distributions were not significantly different across the three groups.

3. Total Fixed Monthly Obligations as Percent of Pretax Income. The distributions of monthly obligations to income (Exhibit 7) indicate that borrowers who chose loans with fixed monthly payments were more likely to

have less budget flexibility (75 percent or more of monthly income committed to current obligations) than those who chose variable monthly payments. Here, monthly obligations included debt payments, housing expenses, child support, medical expenses, insurance costs and any other regular monthly obligations. Total monthly income included one-twelth of actual annual income from all sources before taxes and other deductions for 1983, the year that ended at least six months prior to the point in time when the data were collected. Those with adjustable-rate, fixed payment loans were the most likely of the three groups to have fixed obligations which absorbed 75 percent or more of monthly income.

The results provide an interesting profile of Group II, those with adjustable-rate loans who opted for a fixed monthly payment. Group II was generally more pessimistic about the future than Group III. They were also generally more risk averse than Group III. They were like Group III in that they had monthly income that varied somewhat or greatly. However, they were unlike Group III in that they were already heavily burdened with debt repayment obligations and other fixed monthly expenses. Group I (fixed-rate) can be characterized as pessimistic and risk averse but with relatively low fixed obligations relative to income. Group III (adjustable-rate, adjustable-payment) is optimistic and risk-neutral or risk-loving and also has relatively low fixed obligations relative to income. Group II (adjustable-rate, fixed-payment) is pessimistic and risk-averse but with some variability in monthly income and heavy monthly obligations relative to income. These profiles suggest that economic expectations drove the choices of Groups I and III. However, Group II

EXHIBIT 5

ATTITUDE TOWARD FINANCIAL RISK

	Group I	Group II	Group III
	Fixed-Rate	Adjustable-rate	
		Fixed-payment	Adjustable-payment
Willing to take:			
Above average risk	15%	17%	31%
Average risk	59	59	52
No risk	26	24	17
	100%	100%	100%

$X^2 = 7.78$ Groups not significantly different at ten percent level of confidence

Response to: How much FINANCIAL RISK are you (and your husband/wife) willing to take when you SAVE, INVEST, or BORROW?

___ Take SUBSTANTIAL financial risk expecting to make SUBSTANTIAL financial gains.

___ Take ABOVE AVERAGE financial risks expecting to make ABOVE AVERAGE financial gains.

___ Take AVERAGE financial risks expecting to make AVERAGE financial gains.

___ NOT willing to take ANY financial risks.

SOURCE: CRC Adjustable-rate Study, 1984.

EXHIBIT 6

VARIABILITY OF MONTHLY INCOME

	Group I	Group II	Group III
	Fixed-Rate	Adjustable-Rate	
		Fixed-payment	Adjustable-payment
Income varies:			
Little	72%	59%	61%
Somewhat	22	34	31
Greatly	6	7	8
	100%	100%	100%

X^2 = 3.34 Groups not significantly different at ten percent level of confidence

Response to; Does your monthly income go up and down frequently or stay about the same? Varies little; Varies somewhat; Varies greatly.

SOURCE: CRC Adjustable-rate Study, 1984.

EXHIBIT 7

TOTAL FIXED MONTHLY OBLIGATIONS TO MONTHLY INCOME

	Group I	Group II	Group III
	Fixed-Rate	Adjustable-Rate	
		Fixed-payment	Adjustable-payment
0-49.9%	66%	47%	65%
50-74.9%	23	40	29
75% or more	11	13	6
	100%	100%	100%

X^2 = 8.27 Groups significantly different at ten percent level of confidence.

TOTAL FIXED MONTHLY OBLIGATIONS includes total monthly debt payments, housing expenses, child support, medical expenses, insurance costs and any other regular monthly obligations.

TOTAL MONTHLY INCOME includes the total pretax income from all sources realized by the household in 1983 divided by 12.

SOURCE: CRC Adjustable-rate Study, 1984.

chose that loan contract that would have the smallest impact on monthly cash flow.

An analysis of the importance ranking of various loan contract terms did show that Groups I and II placed more importance on the size of the monthly payment relative to other contract terms than Group III. However, the distributions of the importance ranking of size of monthly payment were not significantly different for the three groups. A point of interest is that the three groups did not differ significantly in terms of their views of the relative importance of the APR for a loan contract.

C. Demographic Characteristics

Although we did not state hypotheses of differences in demographic characteristics of the three groups, there were some interesting differences that provide useful information for identifying markets for various types of loan contracts.

The distributions of total family income for each of the three groups showed that Groups I and III were quite similar while Group II contained a greater percentage of consumers with less than $10,000 in income (Exhibit 10). This result is consistent with the finding that members of Group II had more budget constraints than the other two groups.

The distributions of employment status showed that more than half of those households choosing the adjustable-rate, adjustable-payment option were two-income families. Such households conceivably would have greater budget flexibility than households with one income and might be in a better position to absorb the risk of an adjustable monthly loan payment.

EXHIBIT 10

DEMOGRAPHIC CHARACTERISTICS

	Group I	Group II	Group III
	Fixed Rate	Adjustable Rate	
	Fixed Payment	Fixed Payment	Fixed Term
A. Income (total family before-tax income)			
Less than $10,000	4%	11%	6%
$10,000	25	29	19
$20,000-39,999	38	46	41
$40,000 or more	32	14	34
	100%	100%	100%
B. Employment status			
Married--one employed	20	19	11
Married--two employed	40	38	52
Single--unemployed	3	5	2
Single--one employed	37	38	35
	100%	100%	100%
C. Education - Male			
High school or less	40	34	16
Vocational/some college	31	32	38
College degree	19	26	34
Advanced degree	10	8	12
	100%	100%	100%
D. Education - Female			
High school or less	44	41	20
Vocational/some college	25	37	42
College degree	23	18	31
Advanced degree	9	4	7
	100%	100%	100%

SOURCE: CRC Adjustable-rate Study, 1984.

Finally, the distributions of education for the three groups show that Group III (adjustable-rate, adjustable-payment) was largely composed of consumers with at least some college education. This result is a positive finding for marketers of adjustable-rate loans. It suggests that perhaps those who choose contracts that put most of the risk-burden on the consumer do understand the presence and magnitude of the risk, a condition that is consistent with the role expectations played in the choices of these consumers.

IV. Multivariate Analysis: The Choice Process

To extend on the power of the univariate relationships between the expectation and other economic variables and consumers' choice of contract terms and the interrelationships among the variables, we used the variables discussed in Section III to develop a multivariate model of consumers' choice of contract terms. A three-group multiple discriminate model was estimated.

The estimated model included two discriminant functions (Exhibit 11). The first function was most highly correlated with family income, attitude toward financial risk, and the ratio of fixed monthly obligations to monthly pretax income and difficulty in saving. The second function was most highly correlated with the variables reflecting borrower's expectations of future inflation, expected auto loan rates and stability of family income.

EXHIBIT 11
PREDICTORS OF BORROWERS' CHOICES OF
CONSUMER CREDIT CONTRACT TERMS

Variables	Group Means: Group I Fixed-Rate	Group II Adj.-rate Fixed-Payment	Group III Adj.-rate Adj.-payment	Univariate F-statistic	Correlated With Function (correlation coefficient in paren)
Expectations:					
Financial position 1=better;3=worse	1.53	1.59	1.35	1.56	Function 1 (.35)
Average annual inflation 1=≤5%; 3=≥10%	2.23	2.07	1.90	2.16*	Function 2 (.41)
Real income 1=increase;3=decrease	2.25	2.13	1.82	3.02*	Function 1 (.41)
Auto loan rates 1=above current;3=below current	1.53	1.70	1.78	1.28	Function 2 (-.38)
Risk preferences 1=risk loving	3.09	2.96	2.65	4.43*	Function 1 (.49)
Difficulty in saving for purchase 1=difficult	1.98	1.69	2.18	8.18*	Function 1 (-.76)
Family incomes	37K	28K	38K	4.60*	Function 1 (-.50)
Stability of income 1=varies little	1.40	1.50	1.54	.54	Function 2 (-.26)
Ratio of fixed monthly obligations/ monthly income	.46	.52	.41	3.54*	Function 1 (.50)
Education	3.45	3.57	4.10	2.92*	Function 1 (-.43)

*Significant at ten percent level.

If one were to characterize the two dimensions affecting consumers' choice on the basis of the variables associated with each function, the first function which explains 64 percent of the variance explained by the two functions, represents the financial sophistication or ability of the household, factors which are generally controlled by the household. Consider that ability to plan and save for purchases and risk preferences are highly correlated with the first function as well as family income and financial flexibility as it is captured by the percent of monthly income that is committed to various fixed expenses. The second function, alternatively, picks up the households' opinion about economic environmental influences such as future inflation, future auto loan rates and stability of income--variables that are not directly under the control of the household.

When the two discriminant functions were used to classify the sample into the three groups, 53 percent of the sample was correctly classified. Given that about half of the sample correctly belonged in Group II, these prediction results are not strong, especially since the classification test was executed with the same sample for which the model was estimated (i.e., no hold-out sample). However, there are some interesting outcomes in the classification results to consider.

With the two function model 82 percent of Group II (adjustable-rate, adjustable-payment) was correctly classified. The fixed-rate group (Group I) was more likely to be misclassified in Group II than to be correctly classified in Group I. We expected similarities in Groups I and II because both groups had chosen a loan with a fixed monthly payment. When the

second function in the discriminant model was suppressed, 70 percent of Group I was incorrectly classified as a member of Group II. This suggests that Group I and II did not differ significantly in terms of financial sophistication but did differ in terms of economic expectations.

In summary, the multivariate analysis shows that the three groups of borrowers are not distinctly different along the two dimensions characterized by the discriminant functions although there were statistically significant differences in univariate means analysis for most of the variables included in the discriminant analysis.

V. Adverse Selection of Adjustable-Rate Loans by High-Risk Consumers

One of the issues of policy regarding the administration of adjustable-rate lending programs is determining appropriate credit standards for acceptable adjustable-rate loan customers relative to fixed-rate loan customers. Adjustable-rate lending provides the lender with an opportunity to reduce the interest-rate risk of the loan portfolio. However, if adjustable-rate loan portfolios are characterized by a higher default rate than fixed-rate contracts, then some benefits of lower interest rate risk are offset by higher credit risk. (See Santomero (4)).

The bank which administered the loan program from which the sample for this study was drawn did not vary credit risk acceptance standards for fixed- versus adjustable-rate loan customers. Consequently, the data collected in this study are useful for evaluating the effects of adverse selection bias. In other words, do high-risk consumers select credit contracts with features that increase the probability that they may

default? To address this issue, we analyzed the distributions of credit risk for the three groups of consumers as calculated by the lender.

Credit Score: The credit scores of the entire sample ranged from 186 (high-risk) to 331 (low-risk) (Exhibit 12). When the distributions of credit scores for each of the three groups were divided into thirds, a significantly higher percentage of the the consumers who had chosen the fixed-payment contracts were in the highest-risk third of the distribution than was true for consumers who had chosen the adjustable-rate, adjustable-payment contracts. When only Groups I and II were analyzed by credit score, there was not a significant difference in the credit score distributions. These results do not support the notion of adverse selection bias--that high-risk consumers choose those loan contract terms that would make them more vulnerable to default. Rather, the evidence supports the notion that high-risk consumers have a tendency to select contract terms that shield them from payment shock--they choose contract terms with fixed monthly payments.

EXHIBIT 12

CREDIT SCORE DISTRIBUTION

	Group I	Group II	Group III
	Fixed Rate	Adjustable Rate	
		Fixed Payment	Adjustable Payment
Bottom third	40%	47%	34%
Top two-thirds	60	53	66
	100%	100%	100%

x^2 = 8.046 Groups significantly different at ten percent level of confidence.

SOURCE: CRC Adjustable-Rate Study, 1984.

VI. Conclusion

This analysis of consumers' choice of loan contract terms suggests that consumers benefit from having the ability to choose between an adjustablerate and a fixed-rate loan and to further choose between having an adjustable-payment and a fixed-payment adjustable-rate loan. The benefits derive from the fact that consumers differ in terms of expectations and risk preferences. The availability of a choice of contract terms allows them to find that loan contract that has the lowest expected cost. Here, we must stray from the definition of cost as revealed by the initial APR and incorporate total expected risk-adjusted costs over the life of the contract as determined by individual risk preferences and expectations.

The results of this study also has some interesting policy implications for administration of adjustable-rate consumer loans. The issue of trading interest rate risk for credit risk is a real factor to be considered by lenders. Most of the consumers who are attracted to adjustable-rate loans had very high monthly obligations and were high-risk borrowers. However, adjustable-rate borrowers who had the least flexibility in their household budgets and who were in the highest-risk third of the credit score distribution tended to select contracts with the fixed monthly payment option, consequently shielding themselves against "payment shock" and lenders against dramatic changes in their ability to repay debt in the event of large changes in the interest rate. These results reinforce the importance of providing consumers, who are less able to hedge against inflation than institutions, with enough information about

their contracts to evaluate the potential for "payment shock". And, it is evident that consumers are not averse to adjustable-rate contracts if the lender provides them with a way to manage the payment risk associated with adjustable-rate consumer loan contracts.

FOOTNOTES

[1]The sample was drawn by taking the most recent loans originated and continuing through the file until an adequate number of borrowers was included. The loans in the sample were originated in April and May 1984.

[2]Our cooperating bank introduced the adjustable-rate loan program in October 1981.

[3]Each respondent was paid $3 for returning a completed questionnaire.

[4]Five questionnaires were returned too late to be included in the analysis.

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Respondent No. _____

A. Characteristics of Recent Auto Loan

1. When you were shopping for the new auto loan you have with Merchants National Bank, how did you rank these terms of the loan contract. [Use scale of 1 to 5 with 1 = very important; 5 = not important.]

____ Dollar amount of interest or finance charge
____ Size of the monthly payment
____ Size of downpayment
____ Annual percentage rate of interest
____ Stability of the monthly payment
____ Maturity or length of loan

2. The loan that you obtained may be a FIXED-RATE loan; that is, the INTEREST RATE charged DOES NOT VARY during the life of the loan. Or, it may be an ADJUSTABLE-RATE LOAN; that is, the INTEREST RATE may GO UP OR DOWN during the period that the loan is outstanding.

a. At the time that you arranged for the loan, did you have a CHOICE between a fixed-rate or adjustable-rate loan?

____ Knew only about the fixed-rate loan.

____ Knew only about the adjustable-rate loan.

____ Knew about both fixed-rate and adjustable-rate loans.

b. Which TYPE of loan did you obtain?

____ Fixed-rate loan [SKIP TO QUESTION 3]

____ Adjustable-rate loan

c. When the interest rate CHANGES on your loan, what happens?

____ Only the SIZE of the MONTHLY PAYMENT changes.

____ Only the NUMBER of MONTHLY PAYMENTS changes.

____ Don't remember.

B. Economic Attitudes

We are interested in how people are getting along financially and their outlook for the future.

3. Looking ahead—do you think that A YEAR FROM NOW you (and your family) will be BETTER OFF financially, or WORSE OFF, or just about the SAME as now?

___ Better Off ___ Same ___ Worse Off ___ Don't know

4. The annual rate of inflation CURRENTLY is about five percent. Over the next 3 to 4 years, do you think the AVERAGE ANNUAL RATE OF INFLATION will be

___ 5% or less ___ 6-10% ___ Over 10% ___ Don't know

5. Over the next 3 OR 4 YEARS do you expect YOUR (FAMILY) INCOME will go up MORE THAN INFLATION, about the SAME AS INFLATION , or LESS THAN INFLATION?

___ Income up more than inflation ___ Income up same as inflation ___ Income up less than inflation ___ Don't know

6. On average over the next 3 OR 4 YEARS, do you expect INTEREST RATES FOR AUTO LOANS to be ABOVE THE CURRENT LEVEL, ABOUT THE SAME, or BELOW THE CURRENT LEVEL?

___ Above ___ Same ___ Below ___ Don't know

7. How much FINANCIAL RISK are you (and your husband/wife) willing to take when you SAVE, INVEST, or BORROW?

___ Take SUBSTANTIAL financial risk expecting to make SUBSTANTIAL financial gains.

___ Take ABOVE AVERAGE financial risks expecting to make ABOVE AVERAGE financial gains.

___ Take AVERAGE financial risks expecting to make AVERAGE financial gains.

___ NOT willing to take any financial risks.

C. Instalment Debt

8. What about SAVING MONEY IN ADVANCE for large purchases like furniture, a refrigerator, and things like that--do you find it

___ VERY DIFFICULT ___ SOMEWHAT DIFFICULT ___ NOT at all DIFFICULT

9. Do you RENT or OWN the dwelling in which you live?

___ Rent. Approximately how much are the following expenses per month?

Rental payment $_____

All utilities not included in rent $_____

SKIP TO QUESTION 13, if you RENT.

___ Own. Approximately how much are the following expenses per month?

Mortgage payments $_____ All utilities $_____

Lot rent (mobile home) $_____

Maintenance and club fees (condominium) $_____

Property taxes not included in mortgage payment
$_____ per year

Homeowner's insurance not included in mortgage payment
$_____ per year

10. Do you have a MORTGAGE or MORTGAGES on your home?

___ YES ___ NO. Skip to Question 13.

11. Do any of those mortgages have MONTHLY PAYMENTS that can GO UP OR DOWN as a result of CHANGES in INTEREST RATES?

___ NO. Go to Question 13

___ YES. Payment on first mortgage can change.

___ YES. Payment on second mortgage can change.

12. Now, thinking only of the mortgage that has an interest rate that can go up and down: (If you have two variable rate mortgages, report following information for the largest mortgage.)

a. How OFTEN can the rate change? _____ times per year.

b. What is the MAXIMUM AMOUNT the RATE can CHANGE per year? _____ percentage points ___ No limit

c. What is the HIGHEST RATE that could be charged on your mortgage? _____ percentage points ___ No limit

d. In what year was the loan obtained? _____

e. What is the approximate CURRENT LOAN BALANCE? $_____

f. How many years until the loan matures? _____

g. What is the CURRENT monthly payment? $_____

13. In ADDITION to the auto loan that you just obtained and any payments for your housing that you've already told us about, you may make OTHER PAYMENTS ON LOANS. These might be other automobile loans, home repair and modernization loans, unsecured loans from various sources, and the like. EXCLUDING CREDIT CARD PAYMENTS, what are your (and your family's) approximate TOTAL MONTHLY PAYMENTS ON DEBTS other than those you have already told us about?

$_____ per month ____ No other loans

D. Information About Family

14. What is your MARITAL STATUS?

___ Married [Please answer questions for both husband and wife.]

___ Married--legally separated

___ Single

15. How LONG have you lived at your PRESENT address? ____ years

16. In what YEAR were you (and your spouse) born?

_____ (Male) (Year) _____ (Female) (Year)

17. Please circle the number shown below that best describes the HIGHEST LEVEL of SCHOOLING that you (and your spouse) completed.

	Male	Female
Did not finish high school	1	1
High school graduate	2	2
Training or vocational school	3	3
Attended college courses	4	4
College graduate	5	5
Advanced college degree	6	6

18. Please circle the number below that best describes your (and your spouse's) EMPLOYMENT STATUS.

	Male	Female
Employed full-time	1	1
Employed part-time	2	2
Not employed/retired	3	3

[SKIP TO QUESTION 20 IF NEITHER ARE EMPLOYED]

19. How many YEARS have you been employed in your (and your spouse) CURRENT job?

MALE _____ years FEMALE _____ years

20. How many people depend on the family income for their PRINCIPAL means of support? This is the total number of EXEMPTIONS that you will report this year on your Federal income tax form.

Number of exemptions ____

21. What was the TOTAL INCOME from all sources BEFORE TAXES AND OTHER DEDUCTIONS received by your family living at this address during 1983?

$_____

22. Does your monthly income go up and down frequently or stay about the same?

___ Varies little ___ Varies somewhat ___ Varies greatly

23. Now consider any ADDITIONAL FIXED EXPENSES not already covered that must be met each month from this income. These are outlays that must be met BEFORE outlays on such things as food, clothing, gasoline, and entertainment.

How much do you pay for the FOLLOWING EXPENSES EACH MONTH?

	Average Monthly Payment
Child support	$_____
Child care because you (or your spouse) work	$_____
Regular treatment of a long-term or chronic ailment	$_____
Life or medical insurance	$_____
Any other regular monthly payments (SPECIFY)	
_____	$_____
_____	$_____
_____	$_____

If you have any questions about the questionnaire please contact Professor Charlene Sullivan at 317-494-4380. Thank you for your cooperation. Please return the questionnaire in the enclosed envelope. We will put your cash in the mail after checking the completeness of your questionnaire.

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